International Cooperative Engagement Program for Polar Research (ICE PPR)

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OPNAV N94
WHAT IS ICE PPR?

• Multi-lateral framework to enable Mil-Mil and Mil-GOV RDT&E cooperation
  – THERE ARE NO EXISTING FRAMEWORK AGREEMENTS, THAT ADDRESS WHAT THE MOU PARTICIPANTS WANT TO ACCOMPLISH UNDER ICE-PPR!

• Overarching framework agreement, led by an Executive Steering Council, with the ability to:
  – Establish Working Groups using Terms of Reference (TOR), for the purpose of harmonizing requirements to enable potential cooperative projects
  – Permit the exchange of RDT&E information and the establishment of Project Arrangements (PAs) with at least two of the nations
  – Enable Cooperative Project Personnel (CPP) and Equipment & Materiel Transfer Agreements (E&MTA)
  – Identify opportunities for Experimentation, Demonstration, Exercises (EDE)

• Enable easier transition of basic research to more applied research carried out by governments, academia, industry partners, etc..

• Focus on Cooperative Projects Agreements (PAs), Personnel Exchange and Demonstrations
  – More emphasis on activities and contributions than information exchange

• Partners include ALL Gov Agencies, Academia, Industry Partners
• Participants include Canada, Denmark, Finland, New Zealand, Norway and Sweden.
Potential Cooperation Activities

- The MOU Scope enables the development of projects in mutual areas of interest, such as:
  - Polar **Environmental Modeling**, prediction, and information sharing;
  - Polar **Sensors** and Remote Sensing techniques;
  - Polar **Communications** and Situational Awareness;
  - **Platform** Design and Performance for Polar Environments;
  - RDT&E **Infrastructure** in and for Polar Environments;
  - Experimentation and **Demonstrations** in Polar Environments;
  - **Education**, Training and Exercises;
  - Personnel **Exchanges**;
  - **Navigation** in Ice Conditions;
  - Logistics, including **Energy Generation** and Energy Efficiency, in Polar Environments;
  - Polar **Meteorology, Hydrography** and **Oceanography**;
  - Human Performance and Operations in Polar regions, e.g., medical, physiology
  - **Social Science** Research; and
  - **Operations Research**.

*Working Groups will generate PAs, Personnel and Materiel Exchanges*
WHY ICE PPR?

• Polar Regions remain challenging operating environments, with harsh climates, vast distances, and little infrastructure
  – These issues, coupled with limited operational experience, are just a few substantial challenges the U.S. DoD will have to overcome in Polar Regions
• Focus areas developed to help close any capability gaps for current Arctic operations
  – Environmental (Air/Ocean Observations, Modeling, Exercises, Charting)
  – Human Performance (Warfighter Performance/Sustainability, Food, Shelters)
  – Platforms (Land, Air, Sea, Subsurface, Manned, Autonomous)
  – Situational Awareness (Sensors, Satellites, Tactical Decision Aides)

Non ice-strengthened vessels working in ice covered waters and Sailors wearing Damage Control gear for cold weather protection
RDT&E appropriations finance research, development, test and evaluation efforts performed by contractors and government installations to develop equipment, material, or computer application software; its Development Test and Evaluation (DT&E); and its Initial Operational Test and Evaluation (IOT&E). These efforts may include purchases of end items, weapons, equipment, components, and materials as well as performance of services – whatever is necessary to develop and test the system.

**What the proposed MOU will cover**

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<th>Research, Development, Test &amp; Evaluation (RDT&amp;E)</th>
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**RDT&E**

- **Basic Research**
- **Applied Research**
- **Advanced Technology Development**
- **Advanced Comp. Development & Prototypes**
- **System Development & Demonstration**
- **RDT&E Management Support**
- **Operational System Development**

*UNCLASSIFIED*
Continuously Recruiting Working Group Members from All Gov, Academia, Industry (NOAA, NASA, NSF, DoE, DoS.....)
Multilateral Cold Regions Workshop

7-9 MAY 2019, U.S. Army Corps of Engineers, Cold Regions Research and Engineering Lab (CRREL), Hanover, New Hampshire

Participants: Finland, Norway, Sweden, U.S. Army

Objective: Build an S&T roadmap to address Defense technology gaps/requirements regarding military operations in extreme cold environments

S&T Topics:
- Biomedical Considerations in Human Performance Enhancement and Prediction (frostbite/injury prevention and treatment)
- Lethality (weapons/munitions performance in extreme cold weather)
- Manned and Unmanned Vehicles (Arctic mobility)
- Point and Remote Sensing (radars for snow/ice terrain)
- Soldier Sustainment and Performance (nutrition, hydration, clothing)
- Detection and Remediation of Hazardous Biologicals and Chemicals (permafrost pathogens CBRN)
ICE PPR Status Update
24APR20

• MOU Final Edits Approved by OSD
  – Ready to Sign version returned to partners for final approval 23APR20
  – MOU Signature mid-late JUN20

• ICE PPR 6th National Principals meeting in Nov 11-14, 2019 in Christchurch, New Zealand.
  – Cold Weather Clothing, NZ Polar Ship Design, Southern Ocean Waves Research Discussed
• Environmental and Human Performance Working Groups have been active
  – OP Nunalivut Participation (CAN, US)
    • Human Performance exercise executed by DRDC (Vaughn Cosman)
  – Arctic Buoy Airborne Deployments (CAN, DEN, US)
    • 3 High Arctic Buoy Drops (Over 50 Sensors Deployed); Plans Summer 2020 (COVID-Unknown)
  – Danish Navy Surface Deployments/Iceberg Tagging Summer 2020 (COVID-Unknown)
• U.S. Army has joined ICE-PPR to leverage emerging Cold Regions Research
• WG/XO Meeting VTC 5-8 May; Principals Meeting in Oslo, Nov 20
• Working Group POCs:
  – Environmental (US ONR turning over to….) - john.e.woods@navy.mil
  – Human Performance (ONR Code 34) - patrick.mason@navy.mil
  – Situational Awareness (Church Kee) – rakee@Alaska.edu
  – Platforms (US PEO Ships/NAVSEA)- glen.sturtevant@navy.mil  james.s.webster@navy.mil
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ICEPPR Videos

https://www.youtube.com/watch?v=MafkJMr5jCQ

US Arctic Strategies
DoD

• 3 Strategic Ways
  – Building Arctic awareness
  – Enhancing Arctic operations
  – Strengthening the rules-based order in the Arctic

• Supporting Objectives
  – Ensure security, support safety, and promote defense cooperation
  – Prepare for a wide range of challenges and contingencies
US Arctic Strategies
DoN

• Strategic Objectives
  – Defend U.S. sovereignty and the homeland from attack
  – Ensure the Arctic remains a stable, conflict-free region
  – Preserve Freedom of the Seas
  – Promote Partnerships within the U.S. Government and with allies and partners to achieve the above objectives

• Interagency and International Cooperation
  – USCG/NOAA/DOE/NASA/NSF/USAF
  – NORAD/NATO

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• Undersea Battlespace and Maritime Domain Access
  – Forecasting for safety of naval operations is also a critical mission that requires ongoing research to account for the changing dynamics in the open-ocean, Arctic, and littorals.

• Understanding and synthesis of ocean-atmosphere-land processes and interactions

• Real-time environmentally adaptive sensors, data processing and systems that can be distributed and operated effectively

• Modeling support for the maritime warfare areas such as sensing, tracking, navigation, communications, neutralization and exploitation

“Be first to field decisive capabilities”
ICE-PPR Exercises

• USN Reserves (ONR-RC) Participation in Operation Nunavut 2019
  – Twin Otter Support from Inuvik (NWT)
  – Canadian Ranger Support from Tuktoyuktuk (NWT)
• Plan was to deploy Environmental Buoys on offshore sea ice
  – Challenging ice conditions; No multi-year sea ice within range
  – Aircraft issues
• Great Relationship Building
  – Beaufort Sea Science Partnerships
  – STEM Event
ICE-PPR Buoy Drops

• 3 Coordinated Airborne Arctic Buoy Deployments
  – International Arctic Buoy Program (IABP), Environment Climate Change Canada (ECCC), Defence Research and Development Canada (DRDC), US Navy ONR Reserve Component (ONR-RC)
• 2017-RDAF (Thule), 2018/19 RCAF (Resolute Bay)
• Filling Large Data Gaps over the Arctic Ocean
• Cost Savings approx. $.25M/year to allow for the purchase of more buoys (IABP)